

Docket No. 1295.44668X00
Serial No. 10/522,027
Office Action dated November 30, 2007

REMARKS

I. Introduction

By the present Amendment, claim 1 has been amended, and claims 5 and 9 cancelled. Accordingly, claims 1-4, 6-8, 10, and 11 remain pending in the application. Claim 1 is independent.

II. Office Action Summary

In the Office Action of November 30, 2007, the Specification was objected to because the title was believed to be non-descriptive. Claims 1-3, 6, and 10 were rejected under 35 USC §102(e) as being anticipated by U.S. Patent No. 6,724,943 issued to Tsuchiya et al. ("Tsuchiya"). Claims 4, 5, 7-9, and 11 were rejected under 35 USC §103(a) as being unpatentable over Tsuchiya in view of U.S. Patent No. 6,151,417 issued to Florent. The cancellation of claims 5 and 9 has rendered part of these grounds of rejection moot. Regarding the remaining claims, these rejections are respectfully traversed.

III. Objections to the Specification

The Specification was objected to because the title of the invention was believed to be non-descriptive. The Office Action required submission of a new title that was clearly indicative of the invention to which the claims were directed.

By the present Amendment, Applicants have revised the Specification to provide a new title, as suggested in the Office Action. The title of the invention has thus been changed to read "EDGE PRESERVATION TYPE IMAGE PROCESSING DEVICE."

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Applicants respectfully submit that the current title is clearly indicative of the invention to which the claims are directed. Withdrawal of this objection is therefore respectfully requested.

IV. Rejections under 35 USC §102

Claims 1-3, 6, and 10 were rejected under 35 USC §102(e) as being anticipated by Tsuchiya. Regarding this rejection, the Office Action alleges that Tsuchiya discloses an image processing device that includes recursive filtering means of smoothing an input image, an arithmetic means for subtracting an input image smoothed by the recursive filtering means from the original of the input data. The Office Action further alleges that the recursive means includes edge setting means for setting at least one edge having a predetermined angle from a scanning line direction of the input image and control means for smoothing the image to be smoothed in correspondence with the edge set by the edge setting means. The Office Action directs reference to various passages where these features are allegedly disclosed. Applicants respectfully disagree.

As amended, independent claim 1 defines an image processing device that comprises:

recursive filtering means for smoothing an input image, the recursive filtering means including edge setting means for setting at least one edge having a predetermined angle from a scanning line direction of the input image and control means for smoothing the image to be smoothed in correspondence with the edge set by the edge setting means;

low-frequency component compression means for setting an amount of compression of low-frequency components of the input image according to an output of the recursive filtering means; and

arithmetic means for compressing the low-frequency components of the input image by subtracting an input image from an original image of the input image using an output of the low-frequency component compression means.

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The image processing device of independent claim 1 includes recursive filtering means for smoothing an input image, a low-frequency component compression means, and arithmetic means for compressing the low-frequency components. The recursive filtering means includes edge setting means for setting at least one edge having a predetermined angle from a scanning line direction of the input image, and control means for smoothing the image to be smoothed in correspondence with the edge set by the edge setting means. The low-frequency compression means sets an amount of compression for the low-frequency components of the input image according to an output of the recursive filtering means. Additionally, the arithmetic means compresses the low-frequency components of the input image by subtracting the input image from an original image of the input image using an output of the low-frequency component compression means.

According to the invention defined by independent claim 1, a recursive filter is used to smooth the input image. As discussed in the Specification, a recursive filter is one which uses a feedback-type configuration to perform filtering of the current iteration of the smoothing process by using the results of preceding iterations of the smoothing process. Additionally, recursive filters are capable of efficiently extracting low-frequency components using a smaller amount of computation in comparison with conventional filters. See paragraph [0004] of the published application.

The Office Action alleges that Tsuchiya discloses all of the features recited in independent claim 1, and provides citations to various passages where these features are allegedly disclosed. Applicants' review of these passages, however, has failed to reveal any disclosure or suggestion for features recited in the invention, nor the interpretations afforded by the Office Action. For example, the Office Action

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alleges that Tsuchiya discloses an image processing device that includes a recursive filtering means of smoothing an input image. Reference is directed to Fig. 3.

Applicants' review of Fig. 3 of Tsuchiya, however, has not revealed any illustration of an arrangement for a recursive filtering means. Rather, Tsuchiya illustrates the arrangement for their filter in Fig. 2. Further, Tsuchiya does not appear to provide any disclosure or illustration that would correspond to a feedback configuration for the filter or smoother. Tsuchiya appears to disclose a non-linear smoother which does not employ previous iterations of the smoothing process. Tsuchiya's smoother performs the smoothing process based only the present input image data. As previously indicated, the use of a recursive filter that employs a feedback loop mechanism significantly reduces the amount of calculations necessary to perform the smoothing process, thereby improving the speed with which the smoothing process can be performed. Tsuchiya simply fails to provide any disclosure for features recited in independent claim 1, such as:

recursive filtering means of smoothing an input image, the recursive filtering means including edge setting means for setting at least one edge having a predetermined angle from a scanning line direction of the input image and control means for smoothing the image to be smoothed in correspondence with the edge set by the edge setting means;

It is therefore respectfully submitted that independent claim 1 is allowable over the art of record.

Claims 2-4, 6-8, 10, and 11 depend from independent claim 1, and are therefore believed allowable for at least the reasons set forth above with respect to independent claim 1. In addition, these claims each introduce novel elements that independently render them patentable over the art of record.

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V. Rejections under 35 USC §103

Claims 4, 5, 7-9, and 11 were rejected under 35 USC §103(a) as being unpatentable over Tsuchiya in view of Florent. Regarding this rejection, the Office Action alleges that Tsuchiya discloses all of the features recited in independent claim 1. Florent is relied upon for disclosing the features that are added by the dependent claims. Applicants respectfully disagree.

As previously discussed, Tsuchiya fails to provide any disclosure for various features recited in independent claim 1. Further, these features are not shown or suggested by Florent. Consequently, the combination of Tsuchiya and Florent still fails to disclose or suggest all of the features recited in the claimed invention. It is therefore respectfully submitted that claims 4, 5, 7-9, and 11 are allowable over the art of record.

VI. Conclusion

For the reasons stated above, it is respectfully submitted that all of the pending claims are now in condition for allowance. Therefore, the issuance of a Notice of Allowance is believed in order, and courteously solicited.

If the Examiner believes that there are any matters which can be resolved by way of either a personal or telephone interview, the Examiner is invited to contact Applicants' undersigned attorney at the number indicated below.

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Applicants request any shortage or excess in fees in connection with the filing of this paper, including extension of time fees, and for which no other form of payment is offered, be charged or credited to Deposit Account No. 01-2135 (Case: 1295.44668X00).

Respectfully submitted,
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